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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

OFFICE OF MYCOLOGY AND DISEASE SURVEY

Vol. XV February 1, 1931 Number 1

FURTHER REPORT ON ROSE MOSAIC IN OREGON

By Frank P. McWhorter, Associate Plant Pathologist, Oregon State Experiment Station.

Since considerable importance is attached to the question "Whence came the rose mosaic," the observations, or rather instances, here reported may prove instructive.

Case 1. A grower (whom we shall here designate as grower "A"), located a short distance out of Portland, Oregon, has a Manetti rose mother-block occupying a small portion of a field which is laid out primarily as a bulb farm. The mother-block is surrounded by cultivated ground bearing non-rosaceous crops. This particular block was examined by M. B. McKay in 1929, and was found to be free from mosaic. Cuttings from the mother-block were sold to grower "B" in the Hillsboro rose district, about thirty miles from the locality of grower "A". Grower "B" wished to use these cuttings to form a disease-free mother-block. During 1929 the cuttings remained clean, and according to the statements of the grower and the examination of McKay, showed no indications of rose mosaic during the 1929 season. In 1930, however, more than thirty per cent of these plants (those in the Hillsboro locality) developed unmistakable mosaic symptoms. The writer throughout the 1930 season repeatedly examined the (parent) mother-block of grower "A" but found no indications of mosaic. Rose plants affected with mosaic were present on grower "B's" farm and were in the immediate vicinity of the new mother-block during both 1929 and 1930. It would appear that the disease passed from the infected plants on "B's" farm to the supposedly clean cuttings. The latter, being for mother-block purposes, were not budded; other kinds of mechanical transmission were highly improbable. However, we have observed a great abundance of certain insects on this farm, some of which appear worthy of test as possible vectors.

A second development of Case 1 refers to the behavior of cuttings on grower "A's" place. This grower took cuttings during 1928 from the clean mother-block and planted them on the edge of his cultivated area at a distance

of about a quarter of a mile from the mother-block. The location of the plantings was immediately adjoining a thick second-growth woods. The writer examined this group of cuttings during August, 1930, and observed that a considerable portion of the plants, especially those nearest the woods, showed unmistakable symptoms of mosaic. This suggested that the mosaic might have spread from some wild plant in the woods. Two kinds of plants showing conspicuous virus-like symptoms were found in the woods immediately adjacent to the diseased cuttings. One of these was the common wild wood-rose, Rosa gymnocarpa Nutt., and the other the thimble berry, Rubus parviflorus Nutt. The mosaic symptoms on the wild rose were clear cut. They were not extreme mosaic symptoms, such as sometimes appear to mutilate the leaves of Manetti under northwest field conditions, but were more comparable to the milder (greenhouse type) symptoms, which are really the more typical expression of the disease. The thimble berry disease showed blanching of the veins, leaf crenation, and other features typical of the rose disease. It seemed to the writer distinctly of the rose mosaic type, an opinion concurred in by Dr. George M. Darrow of the U. S. Department of Agriculture. The symptoms of thimble berry disease do not seem to agree with those of any of the diseases of the virus type already reported on the Rubus sp. The determination of possible relationships between this Rubus virus-like disease and the rose mosaic will, of course, be a feature of our studies here.

The above two instances, which are cited as Case 1, indicate an active spread of the disease under field growing conditions and also suggest possible wild hosts as sources. The following case points to a very different situation:

Case 2. In 1929 one of the Oregon rose growers gave a number of freshly imported English Manetti cuttings to the City of Scappoose for the purpose of establishing a mother-block for park uses. It is a small block consisting of about one thousand plants. These plantings were examined by the writer during the past summer. All the roses produced normal foliage except one group of plants in a portion of a row. There were about fifty plants in this group, all of which showed strong indications of rose mosaic. The writer wrote the grower who had furnished the cuttings to know how many cuttings were in each bundle. He replied that he was not positive but that he thought the number was fifty and that he was certain the number was either fifty or one hundred. From subsequent conversations with the gardener who did the planting it appears that the roses were brought there in the original bundles. An obvious conclusion is that one bundle was diseased and the others were clean and that the disease had come from England. This conclusion is further justified by the fact that no wild or cultivated plants were found in the immediate neighborhood which could be held responsible for introducing the disease.

The extraordinary variation of symptoms and the many unknown factors concerning the rose mosaic invite several explanations of the above cases other than those already suggested. For instance, in considering the apparently clean mother-block case one might presuppose that the cutting and transplanting process initiated some obscure physiological disturbance

which made symptom display possible, and that the wild rose became infected from the cuttings. In regard to the Scappoose case one might conclude that only one bundle of the cuttings was susceptible. However, the suggestions given in the previous paragraphs appear most significant when evaluated in terms of the rose-mosaic situation as it here exists under field conditions.

RAMULARIA BLIGHT OF NARCISSUS

By Frank P. McWhorter, Associate Plant Pathologist, Oregon State Experiment Station

The European Ramularia blight of Narcissus has appeared in the Tillamook region of the Oregon coast. According to the growers in that section it has been present since 1928, but has heretofore never developed in such destructive fashion as it did during the 1930 season. The destructiveness this year was due partly to continual planting in the same field and partly to high humidity. It was first observed by the writer on April 15, at which time it had already partially destroyed the foliage of more than two acres of Golden Spur. By May 5 the above-ground parts of these plants were so completely destroyed that the field resembled fallow ground, except for the presence of a few King Alfred rogues. The growers call the blight "mildew" which term aptly describes the appearance of affected plants when the disease is in active progress. The damage results from defoliation and the premature ripening of the bulb which ensues. The bulbs, while apparently not directly attacked, remain small and fail to size up.

The Ramularia responsible is apparently R. vallisumbrosae, described by Cavara in 1899, from collections made in the botanical Garden of Vallombrosa. There he considered it to be a "veritable plague". He writes (translating) "it spares no species of this genus of ornamental plants and it attacks with such frenzied violence as to wither and dry up the foliage in a very short period of time." It was redescribed in 1906 by Chittenden as R. narcissi. This latter occurrence was in England on the varieties Sir Watkin and Poeticus. In recent years severe outbreaks have been reported from portions of England, especially from Cornwall and the Scilly Isles.

Morphologically the Ramularia in the Oregon material agrees quite closely with the descriptions published elsewhere. The determination of the species has been checked by comparison with specimens in Cavara's exsiocati. The spores of Oregon material average 30 x 4.1 microns with an extreme length of about 42 microns; according to Cavara the spore size is 14 to 44 x 4 microns. The older descriptions have failed to mention the presence of sclerotium-like structures which develop in great numbers on the dying leaves after conidial formation has ceased; they have, however, been recorded in recent English collections. The behavior of the fungus in culture indicates that the structures are the primordia of pycnidia, which under suitable cultural conditions produce numerous multiseptate pycnospores.

In regard to relating the narcissus Ramularia to other Oregon Ramularia on liliaceous hosts, S. M. Zeller has called the writer's attention to two collections: One is on leaves of Maianthemum bifolium var Kamtschaticum and the other is on Smilacina amplexicaulis. In neither of these cases have we as yet observed any of the sclerotium-like structures which appear to be characteristic of the Narcissus species.

The known distribution of the Ramularia disease of Narcissus indicates very pronounced climatic requirements. The original record being from Vallombrosa, we have the first indication of these requirements since the word "vallombrosa" itself implies shady valley. The Scilly Isle locality is notorious for rain and fog. Plate 1 shows the recorded distribution of the disease in Oregon. It will be noted that the disease is limited to a section where an average yearly rainfall of more than 100 inches is to be expected. Our State officials took immediate steps to disinfect all bulb material leaving this zone for other points in Oregon. In previous years (before the disease was recognized) bulbs had left the locality in large quantities, but no disease developed in the localities to which they were shipped. However, the disease did develop in cases where the bulbs were moved from farm to farm in the Tillamook vicinity. As a result of the field survey made this year, we feel that destructive outbreaks are not to be anticipated in the average American bulb-growing community. We would expect a few lesions on a few plants under conditions of average bulb culture, but for the disease to become epiphytotic, as it did in the Tillamook region, seems to require extraordinary climatic conditions.

The fungus shows decided varietal preference. In the Tillamook locality Golden Spur and Henry Irving were completely defoliated; Emperor and Empress practically defoliated; King Alfred was practically immune. E. J. Butler writes that Pheasants Eye is one of the most susceptible varieties in England. There are scattered references in the literature to occurrences on other varieties.

BACTERIAL WILT OF ALFALFA IN WYOMING, 1930

Bacterial wilt of alfalfa caused by Aplanobacter insidiosum has undoubtedly been present in Wyoming for some years although its importance was not realized until recently. An extensive survey of the important irrigated alfalfa regions of the State was made in 1930. The survey showed that this disease is widespread and very destructive.

Forty fields selected at random in Hot Springs and Washakie Counties showed the following percentages of disease:

Number of fields observed	Percentage of diseased plants
10	0
6	Trace - 1
7	5 - 15
10	20 - 60
7	80 - 100

Seventeen fields (over 40 per cent of total) contained from 20 to 100 per cent infection.

Fifty fields examined in Big Horn and Park Counties showed severe infection in many fields. Large acreages were ploughed up because of the poor stand.

Fifty-two fields were examined in Goshen, Platte, and Converse Counties. Approximately 30 to 40 per cent of the fields were infected. In such fields the percentage of infection was around 30 per cent.

Taking into consideration the percentage of disease noted, the loss in stand and the loss from ploughing up poor stands earlier than otherwise necessary, it is estimated that the annual loss from bacterial wilt in Wyoming is approximately 15 to 20 per cent of the entire crop. (J. S. Wiant.)

CORN EAR ROT LOSSES IN ILLINOIS, 1930

Ear rot losses were determined in three rotation systems, three distinct strains of corn, and a composite of average farmers' corn. Plantings were made at various times during May, three fourths of it during the first half of May. None of the conditions were unusual and from observations made in other parts of the State, it is believed that these results are representative of a large area. Diplodia ear rot was unusually prevalent this year for reasons not explained. Fusarium moniliforme rot also was very active. This was caused in part by corn ear worm damage. A total of 780 bushels were sorted with average results as follows:

Diplodia zeae	3.68 per cent ear rot
Fusarium moniliforme	5.77 per cent ear rot
Basisporium gallarum	.03 per cent ear rot
Gibberella saubinetii	trace

(Benj. Koehler)

PEANUT RUST

Peanut Rust (Bullaria arachidis) (Speg.) Arthur & Mains) was discovered at Gainesville, Florida, on October 4, 1930. Fifteen plants in a small experimental greenhouse and nine in an adjacent plot were found generally infected with the uredinial stage of the rust. No other stage was found. Three species and one hybrid of the host plant were found infected as follows: Arachis hypogaea, A. nambyquarae, A. prostrata and hybrid A. hypogaea x nambyquarae.

Seeds of two of these species were introduced from Brazil during the past year and arrived in the hulls or pods. It is believed that the fungus was introduced on this imported material.

Upon discovery of the infection, all plants in the greenhouse and plot were taken up and destroyed. The greenhouse, plot and adjacent walks were thoroughly disinfected with formalin. No distribution or removal of plants had been made from these plantings. Careful inspection of peanut plants in this vicinity failed to reveal a single additional pustule of the fungus. It is believed that the fungus in this case has been entirely wiped out.

The last previous report of this disease in the United States was made by Dr. O. F. Burger in the Plant Disease Bulletin Vol. 5, p.88, 1921. This case occurred on Torry Island in Lake Okeechobee, Florida, November 6, 1920.

Dr. C. D. Sherbakoff reported in the Plant Disease Bulletin Vol. 5, p.50, 1921, on finding peanut rust at Gainesville, Florida, on August 30, 1918. Intermittent search since that time has failed to reveal any trace of the disease. It seems hardly possible that it could have maintained itself unnoticed for over ten years, hence the assumption that it was introduced last year from Brazil where it is known to occur. (Erdman West.)

NEW YORK MARKET PATHOLOGY NOTES

Cyril O. Bratley

TOMATOES

During the week beginning January 4, rail and boat shipments of tomatoes from the lower East Coast of Florida arriving in New York, showed considerable decay following skin punctures. In many of the lots from 15 to 90 per cent of the tomatoes showed severe wounding. The punctures varied from the size of a pin prick to a diameter of one-fourth inch. Many of the punctures were dry and no decay was apparent at time of arrival. It was thought that the tomatoes must have undergone severe wind-whipping in the field as the stock was generally sandy. Very likely many of the smaller punctures occurred during the handling and packing. Tomatoes in shipments arriving during the week of January 11 showed many of the larger breaks of the skin. However, most of the wounds seemed to have occurred several days before picking as many of them appeared to be corked over.

Phoma Rot (Phoma destructiva) at time of arrival was the principal decay following the skin punctures. The rot was prevalent on both green fruit and on fruit which was slightly turning.

Rhizopus Rot (Rhizopus nigricans) was found to cause complete breakdown of many of the riper fruits.

Several of the tomatoes were held in a warm place until ripe to determine the course of the diseases in the ripening room. The majority

of the tomatoes held were badly decayed before they were ripe enough for use. Besides those enumerated above, the decays found on the ripened fruit were Oospora Rot (Oospora lactis parasitica), Cladosporium Rot (Cladosporium fulvum), and several others caused by weakly pathogenic organisms.

Because of the poor quality of the tomatoes many of them found their way to the East Side push-cart markets, where tomatoes with one or two small decayed areas sold for ten cents a dozen. These markets which usually handle very few tomatoes at this time of year were glutted with the inferior fruit.

TANGERINES

Several shipments of tangerines received recently on the New York market from the lower West Coast of Florida showed that 15 per cent of the fruit had large, irregular, light brown dead areas on the skin. In some fruit as much as one-fourth of the area of the skin was involved. The discolored areas on the skin were slightly sunken, moist and in many cases were broken and several sections of the fruit beneath collapsed.

The shippers considered the trouble to be the result of improper concentrations of gas in the coloring rooms. It seems probable that a combination of bruising and gassing was responsible.

Blue Mold Rot (Penicillium digitatum)was found in practically every lesion. However, this decay was considered secondary since cultures made from the dead skin near the margin of the discoloration were usually sterile.

MAINE POTATOES

Late Blight Rot (Phytophthora infestans), during the first two weeks of January was found to have caused on an average of 2 per cent loss on all Maine potatoes examined. This is about normal for this season of the year.

Fusarium Rot (Fusarium Sp.) was found to have caused about 2 per cent decay in Maine potatoes entering New York. This percentage is slightly lower than the average for the past few years.

Net Necrosis (Attributed to various causes) on potatoes from Maine is less abundant than at a similar time last year. Only two of the shipments examined the first half of January contained potatoes showing this disease. In each case only a very small percentage was found. Lots received last year showed as high as 15 per cent of the tubers affected.

PLANT QUARANTINE NOTES

H. S. Dean

Port interceptions:

Elsinoe canavaliae on Lima bean pod from La Cruz, Sinaloa, Mexico (in cargo), intercepted at Nogales, Arizona, January 15, 1931, by Mr. G. C. Martin. Det.: H. S. Dean. (This is the first report of this disease on Lima beans from countries other than Cuba and Porto Rico. H. S. D.)

Tylenchus dipsaci in potatoes has been intercepted (in ship's stores) as follows: From Prince Edward Island, January 8, 1931; from Germany, December 21, 1930 and January 10, 1931, at Philadelphia, Pa., by Mr. W. J. Ehinger; from Germany, January 3, 1931, at Philadelphia, Pa., by Mr. W. W. Chapman; from Holland, January 5, 1931, by Mr. Ehinger; from England, January 7, 1931, at New Orleans, La., by Mr. J. C. Pritchett. Det.: Dr. G. Steiner. (The interception from Prince Edward Island is the first of this nature from this continent; the one from England constitutes our first interception record of this pest in potatoes from that country.)

Tylenchus dipsaci in onion from Holland (in ship's stores), intercepted at Philadelphia, Pa., January 5, 1931, by Mr. W. J. Ehinger. Det.: Dr. G. Steiner.

Aphelenchus avenae in potato from South Africa (in ship's stores), intercepted at Philadelphia, Pa., December 30, 1930, by Mr. W. W. Chapman. Det.: Dr. G. Steiner. This interception is of particular interest in that many males were found in the material examined. The male of this species is seldom seen.

Tylenchus pratensis in Lily-of-the-valley pips from Germany (in cargo), intercepted (twice) at Detroit, Michigan, December 22, 1930, by Messrs. Wood and Gower, and at New York City, January, 1931, by Mr. H. G. Frane. Det.: Dr. G. Steiner.

Phoma citricarpa on orange rind from China (in baggage), intercepted at Seattle, Washington, December 13, 1930, by Messrs. W. H. Wheeler and M. J. Forsell; on December 26, 1930, by Mr. Wheeler, and on December 27, by Mr. Forsell. Det.: Messrs. J. A. Stevenson and H. S. Dean. (This fungus causes the black spot disease of citrus.)

Sphaelmoa sp. on apples from Switzerland (in mail), intercepted at Philadelphia, Pa., November 24, 1930, by Mr. W. J. Ehinger. Det.: Miss A. E. Jenkins. (This fungus is the imperfect stage of Plectodiscella piri, and causes a fruit spot.)

Sclerotinia minor on Cichorium intybus from Belgium (in cargo), intercepted at New York City, December 12, 1930, by Messrs. Kennedy, Latham, Cottier, McMaster, and Whitlock. Det.: Dr. H. H. Whetzel. ("Second report from Europe." H. H. W.)

Ramularia cynarae on globe artichoke from France (in ship's stores), intercepted at Philadelphia, Pa., December 18, 1930, by Mr. W. W. Chapman. Det.: Mr. G. H. Martin.

Phacidium multivalve on holly leaves from Canada (in mail), intercepted at Philadelphia, Pa., December 18, 1930, by Mr. J. A. Ramos. Det.: Mr. G. H. Martin.

Ustilago hordei on barley from Nan Chuang Yung, China (in mail), intercepted at Washington, D. C., December 9, 1930, by Mr. D. P. Limber. Det.: Mr. D. P. Limber.

Uropyxis sanguineae on Mahonia leaves from England (in baggage), intercepted at New York City, December 2, 1930, by Mr. G. A. Samouce. Det.: Mr. R. W. Davidson.

Septoria azaleae on Azalea Carlos Steyaert from Belgium (in cargo), intercepted at Washington, D. C., December 8, 1930, by Mr. D. P. Limber. Det.: Mr. D. P. Limber.

Colletotrichum cereale on Calamagrostis epigeios from Harbin, North Manchuria, intercepted at Washington, D. C., December 22, 1930, by Mr. D. P. Limber. Det.: Mr. G. H. Martin.

Sporonema strobilinum on spruce cones from Germany (in mail), intercepted at New York City, April 30, 1930, by Mr. O. G. Fitzgerald; and on fir cones from Germany (in mail), intercepted by him March 13, 1930. Det.: Mr. G. H. Martin.

Vermicularia herbarum on carnation plant from Germany (in mail), intercepted at New York City, October 4, 1930, by Mr. O. G. Fitzgerald. Det.: Mr. G. H. Martin.

Sphaeropsis rhodocarpa on rose from France (in mail), intercepted at Washington, D. C., November 22, 1930, by Mr. D. P. Limber. Det.: Mr. G. H. Martin.

Cytospora sp. on Sarcocaulon Burmanni from Great Brak River, South Africa (in mail), intercepted at Washington, D. C., October 29, 1930, by Mr. D. P. Limber. Det.: Mr. G. H. Martin.

Cladochytrium tenue on iris leaf from Japan (in baggage), intercepted at Seattle, Wash., September 17, 1930, by Mr. C. V. Scott. Det.: Mr. G. H. Martin.

Tylenchus filiformis, T. pratensis, Aphelenchus parietinus, A. sp., in horseradish root from Germany (in cargo), intercepted at New York City, December 16, 1930, by Mr. R. Shemin. Det.: Dr. G. Steiner.

Melanconium pandani on Pandanus furcatus from Darjeeling, India (in mail), intercepted at Washington, D. C., March 15, 1930, by Mr. D. P. Limber. Det.: Mr. G. H. Martin.

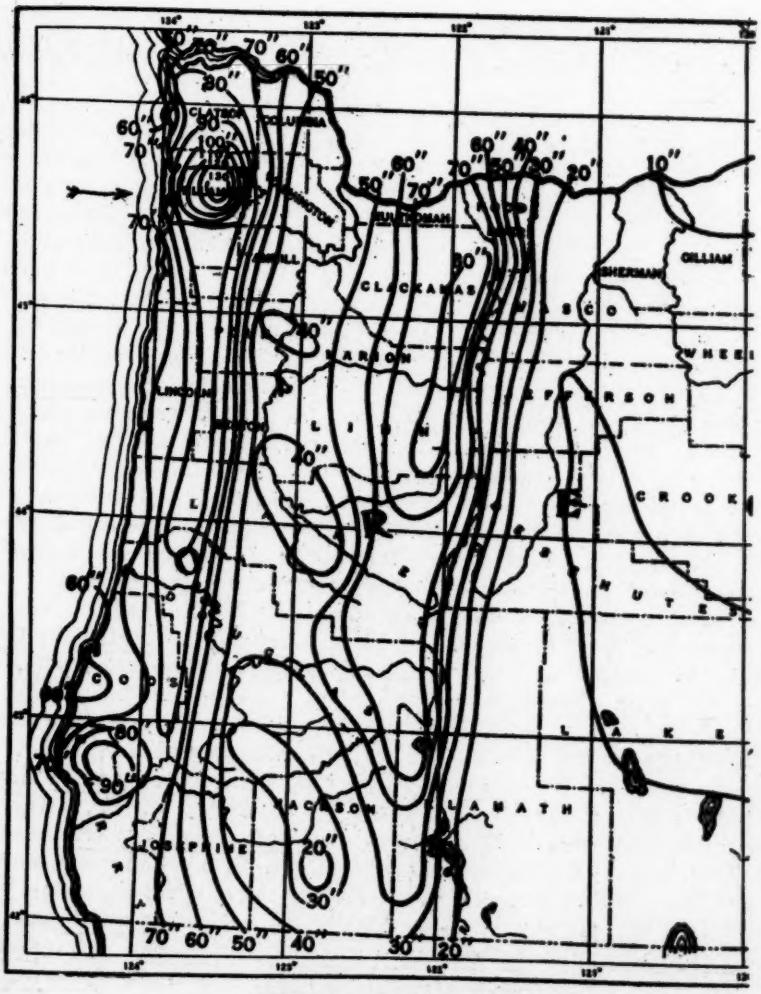
Glomerella cingulata on Cherry wood (strips used in packing) from France, intercepted at Washington, D. C., November 21, 1930, by Mr. D. P. Limber. Det.: Mr. G. H. Martin.

Specimens collected during the field inspection of plant material imported under special permit:

A fungus specimen collected October 11, 1929, by Mr. W. S. Fields, from a dead plant of Laburnum alschingeri on an estate in Essex Fells, N. J., was determined as Phomopsis rudis (Nke) V. Höhn. (the conidial stage of Diaporthe rudis (Fr.) Nke.) by Dr. C. L. Shear and Mr. W. W. Diehl. This determination constituted the first report of this fungus from the United States. It had been reported from Europe, however, and, as this plant had been imported from England, considerable interest was attached to the specimen. The entire plant bearing many pycnidia was secured January 9, 1930, by Messrs. Fields and N. R. Hunt, and the determination was verified by Mr. Diehl. Specimens of P. rudis on Laburnum watereri, L. parksii, L. alpinum, imported from England and on Genista praecox alba, imported from France, also were collected on the same estate at this time (Determinations by Mr. Diehl). Whereupon the inspectors of the Plant Quarantine and Control Administration who inspect special permit plant material in the field were asked to look for symptoms of this disease on Laburnum and close relatives during the growing season of 1930. As a result, several specimens of Laburnum, Genista, Cytisus, and Caragana were submitted and the following records have been completed: Phomopsis (rudis?) on Caragana sp., collected at Tippecanoe, Ohio, by Mr. J. M. R. Adams, det.: Mr. R. W. Davidson; Diaporthe rudis on Cytisus nigricans Carlieri, imported from England, collected September 27, 1930, and on Genista praecox alba, imported from France, collected October 9, 1930, both from Essex Fells, N. J., by Mr. Fields, det.: Mr. G. H. Martin; on Laburnum adami, collected at Locust Valley, L. I., August 13, 1930, by Mr. Fields, det.: Mr. Martin; on Cytisus purpureus vars. incarnatus and pendulus, imported from Holland, collected at Yonkers, N. Y., July 8, and 10, 1930, by Mr. Fields, det.: Mr. Martin; on Laburnum vulgaris (?) collected at San Francisco, California, April 5, 1930, by Messrs. Hunt, A. G. Webb, and E. Walther, det.: Mr. Martin. Other fungi found on the specimens collected in this survey include Phoma sp., Gloeosporium sp., Cytospora sp., Physalospora sp., Sphaeropsis malorum, Diplodia sp., Coniothyrium sp., Cucurbitaria caraganae (det's.: Mr. Martin); Tubercularia vulgaris, Fusarium sp. (det.: Mr. Davidson).

Phomopsis incarcerata on Rosa elegantula imported from England. Collected at Yonkers, N. Y., July 8, 1930, by Mr. W. S. Fields. Det.: Mr. G. H. Martin.

PLATE 1



OREGON RAINFALL 1922

Arrow points to mountainous region near coast where the Ramularia disease of Narcissus did commercial damage.

OREGON RAINFALL 1933